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EXAMINER				
MYERS, JESSICA L				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/532,684

Applicant(s)

PEDERSEN ET AL.

Examiner

JESSICA L. MYERS

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8/27/08.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SG/08)
- Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. The amendment and arguments filed on 8/27/08 under 37 CFR 1.131 have been entered and considered.

Claim Rejections - 35 USC § 112

Second Paragraph (112, 2nd)

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Claim 1 recites the limitations "the valve" in line 17 and "the low pressure connection" in lines 21-22. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-3 and 5-9 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,009,777 to Solomon (Solomon).

In Reference to Claim 1

Solomon teaches a pressure amplifier (see figures 2 and 4) including a low pressure inlet for supplying medium at low pressure (feed water inlet port (45a)), a low pressure piston with a first operational area (large-face area (53) of piston (37)) and at least one high pressure piston with a second operational area (small-face area (55) of piston (37)), the second operational area being of same size or less than the first operational area (see figure 2), and at least one high pressure outlet (port (47)), wherein a low pressure area communicates with an operational chamber, which is limited by the low pressure piston and a surrounding low pressure cylinder (the inlet port (45a) leads to a chamber (inlet chamber (39)) formed between the pump body and the large face of the piston (37)); where the at least one high pressure piston is provided interacting with the low pressure piston (the high and low pressure pistons are connected, and interact in the sense that the pressures applied to each face of the piston controls the position of the piston assembly), and the at least one high pressure piston is co-axially arranged in a high pressure cylinder relative to the low pressure piston (the high pressure and low pressure pistons are arranged on the same axis, the axis that runs through the center of the pump chamber); wherein a changeover valve is coaxially arranged in the low pressure cylinder (valves (65a and 75a) serve as change over valves by controlling which chamber the fluid flows into, and are arranged on the same axis as the pistons),

and in connection with the changeover valve there is arranged at least one spring coaxially around an impulse rod (reset spring (59) is arranged around drive rod (33)); wherein the at least one spring is arranged to be compressed at the movement of the low pressure piston (the reset spring is compressed as the chamber defined by the large faced piston is filled with fluid) so that at least one spring loaded locking mechanism is instantly released (the spring loaded locking mechanism (including cam (143), cam followers (153), and springs (155)) is controlled by the position of the rod (133), which is controlled by the pressures in the piston chambers, as well as by the force of the spring (59a)), the locking mechanism being built up of one or more springs (155) that press a locking member (the cam followers (153)) against a corresponding lock abutment formed in the valve (the cam (143)), so that the valve shifts and opens for medium supply to the operational chamber while simultaneously the low pressure piston, via contact with the high pressure piston, is moving the latter towards the high pressure outlet (as the piston moves from its leftmost position (as shown in figure 2) to its rightmost position (as shown in figure 4), the changeover valve shifts from a closed position to an open position, which allows fluid to flow through the valve), whereby the impulse rod via impulse spring and mechanical stops in the end position releases the locking mechanism whereby the valve shifts and the low pressure medium, via the low pressure connection via a check valve, presses the high and low pressure pistons back (as the valves are opened when the piston reaches its rightmost position, the piston will be forced back to its leftmost position via the spring (59a)).

In Reference to Claim 2

Solomon teaches a pressure amplifier according to claim 1 (see the rejection of claim 1 above), characterized in that the locking mechanism is built up in at least one boring provided radially in the low pressure cylinder (each of the resilient drivers (151) is located in a bore drilled into the sleeve (127)), and that in the boring a ball or a wedge has been provided (cam followers (153)), the ball or wedge interacting with a spring (springs (155)) so that the ball or wedge are pressed down into one of two recesses with same dimensions as the part of the ball or wedge provided in the cylindrical surface of the valve (the cam (143) is generally cylindrical and has two slanted surfaces which form recesses that interact with the cam followers which are approximately the same size).

In Reference to Claim 3

Solomon teaches a pressure amplifier according to claim 1 (see the rejection of claim 1 above), characterized in that the locking mechanism is built up in an annular, flat, round groove provided at the inner side of the low pressure cylinder (there is an annular groove formed in the sleeve (127) which supports a spool and valve assembly), so that at least two U-shaped locking members are arranged in the groove (the cam followers (153) are U-shaped in the sense that they are round), the locking members being chamfered at the ends (the cam followers engage with a cam (143) that is chamfered), that a number of radially oriented borings have been provided (the drivers (151) are each located in a radially arranged bore), corresponding to the number of locking members, and that in each boring there is arranged a spring pressing the locking members towards the centre line of the cylinder (springs (155)) so that the

chamfered ends of the locking members, co-operate hold a locking element arranged in the valve in one of two positions on respective chamfered sides of the locking members (the flanges (139, 141) of the spool and driver rod are held in either a separated position or a joined position based on which side of the cam the cam followers are on).

In Reference to Claim 5

Solomon teaches a pressure amplifier according to claim 1 (see the rejection of claim 1 above), characterized in that the high pressure piston and impulse rod (the small-face area (55) of piston (37) and the drive rod (133)), respectively, are loosely connected to the low pressure piston by means of flanges that are provided at one end of the high pressure piston and the impulse rod (The impulse rod has a collar (159) which mates with a shoulder (161) formed at one end of the high pressure piston. This serves to couple the piston to the drive rod.), respectively, the flanges largely fitting in corresponding cavities provided in the end faces of the low pressure piston so that the flanges are loosely held by means of locking rings (the flanges are further held in place by retaining ring (157) which is held in a cavity in the end face of the low pressure piston).

In Reference to Claim 6

Solomon teaches a pressure amplifier according to claim 1 (see the rejection of claim 1 above), characterized in that the high and low pressure pistons, the high and low pressure cylinders, the check valve and one or more additional check valves, the low pressure connection and a high pressure connection with associated springs and locking mechanisms are arranged coaxially and symmetrically around a common centre

line (the apparatus, including its pistons, its inlets and outlets, and its locking mechanism is arranged concentrically about a center line running through the sleeve (127)).

In Reference to Claim 7

Solomon teaches the pressure amplifier according to claim 1 (see the rejection of claim 1 above), characterized in that the connections between the at least one boring and parallel axial connections and annular channels are established by radial milling from inside the at least one boring (the connections from the inside boring of the sleeve (127) are formed as radial bores leading from the central bore. The requirement that these bores be established by radial milling is a product by process limitation, and it has been held that the method of forming the device is not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight.).

In Reference to Claim 8

Solomon teaches the pressure amplifier according to claim 1 (see the rejection of claim 1 above), characterized in that one or two of the oscillating pistons are used for driving a pump fitted thereon for pumping another medium than the drive medium, or for driving other oscillating apparatuses (the high pressure pump is used to drive a reverse osmosis module (15)).

In Reference to Claim 9

Solomon teaches the pressure amplifier according to claim 1 (see the rejection of claim 1 above), characterized in that externally of the changeover valve, an annular

turning (the cam (143) is an annular turning located externally of the spool valve assembly) is provided with a diameter less than the outer diameter of the changeover valve (the diameter of the cam is less than the diameter of the spool valve assembly when taken with its ports) and a length in longitudinal direction of the pressure amplifier, the length being substantially less than the length of the changeover valve (the cam is approximately half as long as the spool valve), and that at least two holes are provided in the changeover valve radially from the interior of the changeover valve to the outside of the changeover valve (ports (115, 121, 123) are formed as holes leading from the inside of the sleeve (105) to the outside of the sleeve), and that one hole is provided coinciding with the annular turning (port (115) coincides with the cam in the sense that it is adjacent to it), and that the other hole is provided outside the annular turning (the other ports are provided outside the cam in the sense that they are not adjacent to it).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Solomon in view of Japanese Patent Application 2000-87906 to Isamu et al. (Isamu et al.).

In Reference to Claim 4

Solomon teaches the pressure amplifier according to claim 3 (see the rejection of claim 3 above), but does not teach that the pressure amplifier is double-acting.

Isamu et al. teach a similar pressure boosting apparatus (see figures 8 and 9) where a single large area piston (21) is used to feed pressurized liquid to two separate small area pistons (2a and 2b). The small area pistons are arranged at opposite sides of the operational chamber of the large piston, and each small piston has its own outlet valve (13 and 15). It would have been obvious to one of ordinary skill in the art at the time of invention to add an additional small area piston to the apparatus of Solomon in order to make it double acting, which would increase the output rate of the pump.

In Reference to Claim 10

Solomon as modified by Isamu et al. teaches the pressure amplifier according to claim 4 (see the rejection of claim 4 above), wherein the two high pressure outlets are brought together to a common outlet (see figure 8 of Isamu et al. where the two high pressure outlets are brought together at junction 20).

Response to Arguments

9. Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSICA L. MYERS whose telephone number is (571)270-5059. The examiner can normally be reached on Monday through Friday, 8:30am to 5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
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